

Data Limitations and Validation Report

for Lockheed Idaho Technologies

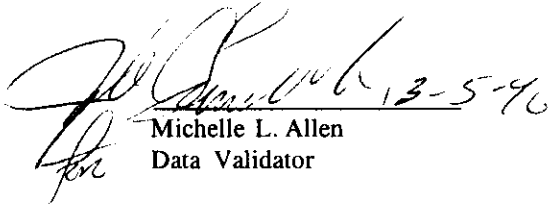
Case No. 93111107, SDG 93111107

Argonne National Laboratory - West

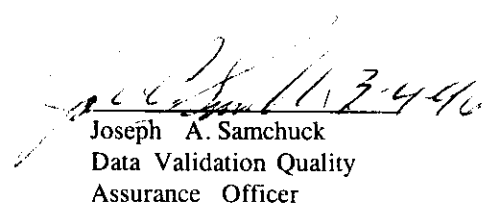
TCL Volatile Organics

One Aqueous Sample

Validated by:

  
Michelle L. Allen  
Data Validator

Approved by:

  
Joseph A. Samchuck  
Data Validation Quality  
Assurance Officer

## TABLE OF CONTENTS

Section	Page No.
1.0 Introduction	1
2.0 Quality Control Summary	1
3.0 Data Completeness	1
4.0 Summary of Data Usability	1
5.0 Summary of Laboratory Performance	4
6.0 Summary of Data Validation Flags	4
7.0 References	4

## 1.0 INTRODUCTION

The Argonne National Laboratory - West sample set for Case No. 93111107, SDG 93111107 consists of one aqueous sample analyzed for Target Compound List (TCL) volatile organic compounds. The analyses were performed by Biospherics, Inc. using the protocols outlined in the "Analytical Laboratory Services for Environmental Groundwater Samples for the Argonne National Laboratory - West" Statement of Work (SOW). A total of 33 TCL sample data points were reported in this analytical data set.

The analytical data from these analyses were reviewed by HALLIBURTONNUS Corporation personnel as Level A in accordance with ERP Standard Operating Procedure SMO-SOP-12.1.3.

## 2.0 QUALITY CONTROL SUMMARY

The data were evaluated based on the following parameters:

- Data Completeness
- \* Holding Times
- \* GC/MS Tuning and Mass Calibration
- Initial and Continuing Calibrations
- \* Blank Analyses
- Surrogate Spike Recoveries
- \* Matrix Spike Results
- Blank Spike Results
- \* Internal Standards Performance
- \* System Performance and Detection Limits
- Laboratory Performance
- \* Compound Quantitation

The asterisk indicates that all quality control criteria were met for this parameter. Problem areas affecting data usability are discussed in Section 4.0 of this report. A Glossary of Data Validation Flags which defines the validation qualifiers applied on a sample-specific basis is presented in Section 6.0.

## 3.0 DATA COMPLETENESS

The data presented in Case No. 93111107, SDG 93111107 consists of TCL volatile organic results for one (1) aqueous sample as follows:

93111107-3 (ANLM-11)

The data package was missing the bromofluorobenzene (BFB) tune (Form V) corresponding to the initial calibration, the initial calibration Form VI containing target compound Percent Relative Standard Deviations (%RSDs) and Relative Response Factors (RRFs), and the associated initial calibration raw data. In addition, the Blank Spike (BS) analysis Form III was not included in this data package. Hence, the data in this SDG could not be evaluated for these parameters. It should be noted that the presentation and documentation of the data package deliverables were extremely poor. The data package does not conform to a Level A deliverable.

## 4.0 SUMMARY OF DATA USABILITY

The continuing calibration Relative Response Factor (RRF) for 2-hexanone was less than the 0.050 quality control limit. Failure to meet this quality control criterion indicates that the laboratory's instruments could not achieve satisfactory sensitivity for this compound, and therefore, the associated nondetected result reported for this compound is severely compromised. Hence, the nondetected reported for 2-hexanone in sample 93111107-3 (ANLM-11) is considered unreliable and qualified as rejected, "R".

Continuing calibration Percent Differences (%Ds) for acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone exceeded 50%. No action was taken for 2-hexanone since the nondetected result reported for this compound was rejected as a result of a more severe calibration noncompliance. The nondetected results reported for the remaining compounds in the associated environmental sample were qualified as estimated, "UJ".

Some continuing calibration %Ds for 1,2-dichloroethane, 1,1,2-trichloroethane, and 1,1,2,2-tetrachloroethane were greater than the 25% quality control limit. No actions were necessary since no positive results were reported for these compounds in the affected sample and the nondetects were not compromised.

The Percent Recovery (%R) for the surrogate spike compound bromofluorobenzene (BFB) slightly below the lower quality control limit in the laboratory method blank. No action was necessary since this is a quality control sample and the environmental sample yielded acceptable surrogate %Rs.

Annotated laboratory Form I data summary reports showing the data and relevant qualifier flags applied are presented in Appendix A of this report. Copies of the unqualified data summary reports as reported by the laboratory are provided in the attached Appendix B. The attached Appendix C includes documentation to support the findings discussed in this report.

A sample-specific summary of the data validation flags applied is depicted in Table 1, appearing on the following page. The qualifier flags used as a result of the validation process are defined in Section 6.0 (Glossary of Data Validation Flags) of this report. Details regarding the application of the validation qualifiers are discussed in the remainder of this section.

#### 4.1 Calibrations

The continuing calibration performed on instrument GC/MS#1 (11/16/93) contained the following RRF which failed to meet the 0.050 quality control criterion.

<u>Compound</u>	<u>RRF</u>
2-Hexanone	0.038
Affected Sample:	93111107-3 (ANLM-11)

The nondetected result reported for this compound in the affected sample is rejected, "R".

The continuing calibration performed on instrument GC/MS#1 (11/16/93) contained the following continuing calibration Percent Differences (%Ds) which exceeded 50%.

<u>Compound</u>	<u>%D</u>
Acetone	55.8
2-Butanone	56.3
4-Methyl-2-pentanone	53.2
2-Hexanone	87.9
Affected Sample:	93111107-3 (ANLM-11)

No qualification was necessary for 2-hexanone since the nondetected result reported for this compound was rejected as a result of a more severe calibration noncompliance. The nondetected results reported

**TABLE1**

**Lockheed Idaho Technologies**

**Argonne National Laboratory - West**

**Case No. 93111107, SDG 93111107**

**TCL Volatile ORGANICS**

---

Sample No.	Qualifier Flags
------------	-----------------

---

93111107-3 (ANLM-11) J <sup>1</sup>	R <sup>1</sup>
-------------------------------------	----------------

---

for the remaining compounds in the associated environmental sample were qualified as estimated, "UJ".

The continuing calibration performed on instrument GC/MS#1 (11/16/93) contained the following continuing calibration Percent Differences (%Ds) which failed to meet the 25% quality control criteria.

<u>Compound</u>	<u>%D</u>
1,2-Dichloroethane	30.0
1,1,2-Trichloroethane	28.0
1,1,2,2-Tetrachloroethane	41.3

Affected Sample: 93111107-3 (ANLM-11)

Only nondetected results were reported for these compounds in the affected sample and these nondetects were not compromised.

#### 4.2 Surrogates

The %R for the surrogate spike compound, BFB, was less than the lower quality control limit in the laboratory method blank. No action was necessary since the environmental sample yielded acceptable surrogate %Rs and this is a quality control sample.

#### 5.0 SUMMARY OF LABORATORY PERFORMANCE

The data associated with the initial calibration was missing from this SDG. The BS analysis Form III was not included. The Chain-of-Custody (C-O-C) form requested Appendix IX TCL volatile organic analysis, however, only results for TCL volatile organic compounds were provided. In addition, the field identification was not used to name the environmental sample, the sample location ("ANLM-11") was used. Hence, the data validator used both the Biospherics laboratory ID, 93111107-3, and the field ID, ANLM-11. It should be noted that several forms had incorrect times and dates, the internal standard Form VII had the wrong continuing calibration areas/retention times, and the BFB Form V was incorrectly completed. The data validator manually corrected these errors. A major calibration noncompliance was noted for 2-hexanone. Some continuing calibration %Ds were noncompliant.

#### 6.0 GLOSSARY OF DATA VALIDATION FLAGS

The following data validation flags were applied to the sample data for reasons detailed previously in this report:

- J<sup>1</sup> - Estimate, "UJ", nondetected results for acetone, 2-butanone, and 4-methyl-2-pentanone as a result of continuing calibration %Ds > 50%.
- R<sup>1</sup> - Reject, "R", nondetected results for 2-hexanone as a result of continuing calibration RRF < 0.050.

#### 7.0 REFERENCES

The data referenced in this report were validated in accordance with the protocols outlined in ERP Standard Operating Procedure SMO-SOP-12.1.3 as presented in ERP-SOW-37. In addition, details stipulating laboratory procedures as outlined in "Analytical Laboratory Services for Environmental Groundwater Samples for the Argonne National Laboratory - West" SOW were referenced.

**APPENDIX A**  
**QUALIFIED LABORATORY RESULTS**

## VOLATILE ORGANIC ANALYSIS DATA SHEET

ANL M-11

Lab Name: BIOSPHERICS INCORPORATED Contract: ARGONNELab Code: ANL M-11 Case No. 93111107 SAS No.: \_\_\_\_\_ SDG No.: \_\_\_\_\_Matrix: (soil/water) WATER Lab Sample ID: 93111107-3Sample wt/vol: \_\_\_\_\_ (g/mL) \_\_\_\_\_ Lab File ID: 8240Level: (low/med) LOW Date Received: 11/11/93% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 11/16/93

GC Column: \_\_\_\_\_ ID: \_\_\_\_\_ (mm) Dilution Factor: \_\_\_\_\_

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

## CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

74-87-3-	Chloromethane	10 <sup>1</sup> U	
74-83-9-	Bromomethane	10 <sup>1</sup> U	
75-01-4-	Vinyl Chloride	10 <sup>1</sup> U	
75-00-3-	Chloroethane	MLL 10 <sup>1</sup> U	
75-09-2-	Methylene Chloride	2127196 10 <sup>1</sup> U	
67-64-1-	Acetone	10 <sup>1</sup> U	UT
75-15-0-	Carbon Disulfide	5 <sup>1</sup> U	
75-35-4-	1,1-Dichloroethene	5 <sup>1</sup> U	
75-34-3-	1,1-Dichloroethane	5 <sup>1</sup> U	
540-59-0-	1,2-Dichloroethene (total)		NR
67-66-3-	Chloroform	5 <sup>1</sup> U	
107-06-2-	1,2-Dichloroethane	5 <sup>1</sup> U	
78-93-3-	2-Butanone	10 <sup>1</sup> U	UT
71-55-6-	1,1,1-Trichloroethane	5 <sup>1</sup> U	
56-23-5-	Carbon Tetrachloride	5 <sup>1</sup> U	
75-27-4-	Bromodichloromethane	5 <sup>1</sup> U	
78-87-5-	1,2-Dichloropropane	5 <sup>1</sup> U	
10061-01-5-	cis-1,3-Dichloropropene	5 <sup>1</sup> U	
79-01-6-	Trichloroethene	5 <sup>1</sup> U	
124-48-1-	Dibromochloromethane	5 <sup>1</sup> U	
79-00-5-	1,1,2-Trichloroethane	5 <sup>1</sup> U	
71-43-2-	Benzene	5 <sup>1</sup> U	
10061-02-6-	trans-1,3-Dichloropropene	5 <sup>1</sup> U	
75-25-2-	Bromoform	5 <sup>1</sup> U	
108-10-1-	4-Methyl-2-Pentanone	10 <sup>1</sup> U	UT
591-78-6	2-Hexanone	10 <sup>1</sup> U	R
127-18-4-	Tetrachloroethene	5 <sup>1</sup> U	
79-34-5-	1,1,2,2-Tetrachloroethane	5 <sup>1</sup> U	
108-88-3-	Toluene	5 <sup>1</sup> U	
108-90-7-	Chlorobenzene	5 <sup>1</sup> U	
100-41-4-	Ethylbenzene	5 <sup>1</sup> U	
100-42-5-	Styrene	5 <sup>1</sup> U	
1330-20-7-	Xylene (total)	5 <sup>1</sup> U	